Response To Rejection Under Section 112:

Claims 1-10 stand rejected under 35 U.S.C. § 112, second paragraph, the Examiner asserting that the language therein is indefinite because the term "essentially" is a relative term.

The term "essentially" is considered definite when suitable guidelines, examples, or cutoffs are provided. M.P.E.P. § 2173.05(b)B. The claims, as filed, provide an explicit cutoff. In particular claim 1 recites that the essentially sulfur free stream contains no more than 0.10 ppm of sulfur compounds, and claim 10 recites that the essentially sulfur free stream contains between about 0.025 ppm and 0.075 ppm of sulfur compounds. Applicant also notes that the term "substantially" is not used in claims 1-10.

Applicant therefore respectfully requests the Examiner to withdraw the Section 112 rejection.

Response To Rejections Under Section 103:

Claims 1-10 stand rejected under 35 U.S.C. § 103(a), the Examiner contending that these claims are obvious over U.S. Patent No. 4,978,439 to Carnell et al. ("Carnell") in view of U.S. Patent No. 4,202,865 to Preston, Jr. ("Preston"). The Examiner apparently reads Carnell as teaching the claimed invention except for using the feed fuel for a fuel cell system as taught by Preston and believes that it would have been obvious to combine Carnell with Preston. The Examiner further believes that it would have been obvious to pressurize the fuel gas stream above 304 kpa and measure the downstream gas flow in order to correlate gas flow rate with the effective operation of the membrane.

Applicant respectfully disagrees with the Examiner's reading of Carnell. Carnell addresses the problem of performing hydrodesulphurization (HDS) when there is low

concentrations of hydrogen, and provides a method for the subsequent reduction of sulfur concentration in a fuel feedstock. In particular, Carnell (a) segregates the fuel feedstock stream into a high-sulfur stream and a low-sulfur stream, (b) passes the high-sulfur stream over a HDS catalyst to convert the organic sulfur into hydrogen sulfide, (c) removes the hydrogen sulfide from the high-sulfur stream by sorption to produce a reduced-sulfur stream, and (d) adds the reduced-sulfur stream to the low-sulfur stream to provide a fuel feedstock having a reduced sulfur concentration.

In contrast, Applicant's invention is not directed toward HDS or even toward reducing sulfur concentration in the fuel feedstock. Rather, Applicant's invention is directed toward providing a fuel cell system with a low-sulfur concentration fuel. In particular, Applicant's invention (1) segregates the fuel feedstock stream into a high-sulfur stream and a low-sulfur stream, (2) passes the high-sulfur stream back into the fuel feedstock, (3) passes the low-sulfur stream through a sulfur selective membrane to reduce the sulfur content, and (4) passes the low-sulfur stream through a sulfur sorbent medium to further reduce the sulfur content for use as a feed fuel for the fuel cell system.

Thus, among other things, Carnell is significantly different because it teaches using sorption to absorb sulfur from the high-sulfur stream. In contrast, Applicant's invention uses a sulfur sorbent medium to absorb sulfur from the low-sulfur stream. Absorbing from the low-sulfur stream presents the sorbent with less sulfur to absorb and an accordingly longer-life sorbent. See e.g. spec., page 3 lines 12-15; pages 9 line 29 - page 10 line 17.

Moreover, Carnell is significantly different because it combines the reduced sulfur high-sulfur stream with the low-sulfur stream to provide a fuel feedstock having an overall reduced sulfur concentration. In contrast, Applicant's invention segregates the reduced sulfur high-sulfur

stream from the low-sulfur stream, passing the high-sulfur stream back into the fuel feedstock which increases the fuel feedstock sulfur content and assists in gas leak detection. (see e.g. spec., page 3 lines 23 - 30), and passing the low-sulfur stream through to the fuel cell system to allow the fuel cell system to operate with the preferred low-sulfur fuel (see e.g. spec., page 1 lines 23 - 29).

In another aspect of Applicant's invention, the gas is filtered by a sulfur selective membrane before reaching the sorbent. This further reduces the amount of sulfur presented to the sulfur sorbent medium, and accordingly further assists in providing a longer-life sorbent.

Further, the Examiner asserts that the concept of pressure differential is well known in the art, and that it would have been therefore obvious to pressurize the fuel gas stream above 304 kpa and measure the downstream gas flow in order to correlate gas flow rate with the effective operation of the membrane. However, the Examiner has cited no prior art for this assertion. "Rarely, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment."" Al-Cite Corp. v. VSI Int'l., Inc., 174 F.3d 1308, 50 USPQ.2d 1161 (Fed. Cir. 1999) (citing W.L. Gore & Assocs., Inc. v. Garlock, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983)). This is not one of those rare cases where the level of skill can supply the missing suggestion to modify the prior art by pressurizing a fuel gas stream above 304 kpa and then measuring the downstream gas flow. Accordingly, Applicant respectfully requests the Examiner to provide an affidavit pursuant to M.P.E.P. § 2144.03 so that Applicant may consider and traverse such affidavit with an affidavit of his own or other means of proof.

In view of the above, it is respectfully submitted that claims 1-10 are patentable. Reconsideration and withdrawal of the Section 103 rejection is respectfully requested.

Discussion Of New Claims 11-20:

New claims 11-20 further define the scope of the invention, as described in the specification and drawings. Applicant respectfully submits that these claims are patentable and thus respectfully request allowance of claims 11-20.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, Applicant respectfully requests that the Examiner reconsider the rejections and timely pass the application to allowance.

Please grant any extensions of time required to enter this paper. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

Dated: 2/11/05

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